

**What is claimed is:**

1. A multiple test system for use in vehicles for measuring characteristics of an engine including an Electronic  
5 Control Unit (ECU), a power transistor and an ignition coil, comprising:

first and second analogue signal receiving sections each for receiving an input signal in the form of a high voltage waveform, which is generated from an ignition plug, through a  
10 connection channel of an external signal;

a non-inverting amplifier for amplifying a first analogue signal inputted from the first analogue signal receiving section;

a comparator for comparing a reference voltage, which is set by applying a predetermined value of voltage, with a second  
15 analogue signal inputted from the second analogue signal receiving section;

a microcomputer having a program for converting the analogue signal generated from the non-inverting amplifier into a first digital signal, converting the second analogue signal into  
20 a second digital signal based upon an output signal from the comparator, applying the reference voltage to the comparator, and controlling the system according to calculation and measurement modes of the converted digital signals; and

a liquid crystal display section for displaying measurements outputted from the microcomputer section.

2. The multiple test system as set forth in claim 1,  
5 wherein the second analogue signal receiving section is connected to a Hall sensor,

wherein the Hall sensor is arranged in a cable connected to the ignition coil for measuring a high voltage inputted into the ignition plug,

10 wherein the comparator compares an analogue signal inputted from the Hall sensor with the reference voltage to generate a square wave if the analogue signal is larger than the reference voltage, and

wherein the microcomputer is synchronous with the square  
15 wave to convert the high voltage analogue waveform signal, which is inputted into the microcomputer, into a digital signal in order to obtain ignition energy through detection and calculation.

3. The multiple test system as set forth in claim 2,  
20 wherein a period of the square wave signal, which is inputted into the microcomputer from the comparator, is measured to calculate the rotation speed of the engine.

4. The multiple test system as set forth in claim 2,  
wherein conversion of a high voltage analogue waveform signal,  
which is inputted into the microcomputer, into a digital signal  
is performed ten times to calculate maximum, minimum and mean  
5 values of the high voltage.

5. The multiple test system as set forth in claim 1,  
wherein the first analogue signal receiving section is connected  
to both ends of a battery,

10 wherein the Hall sensor is connected to the second analogue  
signal receiving section,

wherein the Hall sensor is arranged in a wire connecting  
between an electric generator and the battery to detect a voltage  
ouputted from the electric generator,

15 wherein the voltage of the battery is supplied to the non-  
inverting amplifier, and

wherein the microcomputer measures the voltage/current of  
the electric generator based upon the signals inputted from the  
non-inverting amplifier and the Hall sensor.

20 6. The multiple test system as set forth in claim 1,  
wherein the second analogue signal receiving section is connected  
to both ends of the ignition plug,

wherein the ignition plug has a pressure sensor attached thereto, for measuring the compression pressure within a cylinder, and

wherein the microcomputer successively converts analogue values measured in the pressure sensor into digital values during rotation of the engine, and calculates and outputs maximum and minimum values of the converted pressure values.

7. The multiple test system as set forth in claim 1, wherein the first analogue signal receiving section is connected to both ends of the ignition plug to measure resistances of the ignition plug and other electric resistances.